REMARKS

In the Office Action mailed February 14, 2005, the Examiner objected to the Abstract.

The Examiner also rejected claim 3 under 35 U.S.C. §112, second paragraph.

The Examiner rejected claims 1 and 3-17 under 35 U.S.C. §102(b) for allegedly being anticipated by U.S. Patent 5,087,099 to Stolarczyk.

The Examiner also rejected claim 2 under 35 U.S.C. §103(a) for allegedly being obvious over the '099 patent.

The Examiner also rejected claim 18 for being obvious under §103(a) based upon the '099 patent in view of U.S. Patent 5,029,943 to Merriman.

In view of the clarifications presented herein, it is respectfully submitted that all claims 1-18 are in condition for allowance.

A. The Subject Matter of the Claims

Before turning attention to the noted rejections, it is instructive to consider the subject matter of the pending claims. The pending claims are directed to a face support control system for a face support that includes several support shields, each equipped with a control device. A communication system is provided for transmitting data between the control devices in the face and the face master control located outside the face. A significant and novel feature of the claimed subject matter is that the communication system comprises radio transmission devices, each having receiver and transmitter modules used to perform wireless and cable-free data transmission in the end region of the face. And, it is significant that the data transmission is bi-directional. These features are described in the specification by reference to Figure 1:

> A transmission unit 8 arranged on the right face edge in Figure 1 takes the form of a radio transmission device with receiver and transmission modules to transmit data via the bi-directional, wireless and cable-free radio transmission represented by arrow 11 to a face master control 12 set up, for example, on the surface.
>
> * * *
>
> Radio data transmission 11 therefore spans the face end region, where the main and auxiliary drives...are set up...and the risk of cable damage or tears is particularly high.

Page 5 of the present application.

B. Objection to Abstract Should Be Withdrawn

In view of the amendments to the Abstract set forth herein, it is submitted that the Examiner's concerns have been remedied.

C. Rejection under §112, Second Paragraph, Should Be Withdrawn

Claim 3 has been amended to remove the language "in the face." The now-amended recited "communication device" in claim 3 refers to the "communication device" in claim 1. It is believed that the Examiner's concerns have been remedied. Claim 3 recites the communication device (which according to claim 1 is "for interconnection of the control devices") as comprising "a radio transmission system with transmission and receiver modules, which are spaced a plurality of support shields from each other."

The Examiner also indicated that it was unclear what was meant by "transmission and receiver modules, which are spaced a plurality of support shields from each other." The Examiner is respectfully referred to the specification of the present application. See paragraph 0013:

> In a particularly advantageous embodiment of a face support control system according to the invention, the communication device in the face comprises a radio transmission system with transmission and receiver modules spaced two or more support shields from each other. Bi-directional data exchange of control and condition data of individual or groups of support shields is possible using the radio transmission system, and there is no need for the redundant bus connections as has been previously installed in underground faces. The radio transmission system can also be used to communicate rapidly in both directions between the two ends of the face.

In view of the clarifications presented herein, it is respectfully submitted that this ground of rejection has been remedied.

D. Rejection under §102(b) Should Be Withdrawn

The Examiner rejected claims 1 and 3-17 under §102(b) based upon U.S. Patent 5,087,099 to Stolarczyk.

Before turning attention to the specifics of this rejection, it is instructive to note several distinguishing differences between the subject matter of the claims at issue and the disclosure of the '099 patent to Stolarczyk.

The '099 patent relates to a system which utilizes burst transmission of digitally encoded radio signals which are transmitted by inductive coupling of a transmitter and a receiver through a utility conductor such as a cable. See for example, the Abstract; col.

3, lines 34-37; col. 7, lines 26-36; col. 8, line 4; and col. 12, lines 23-28. The utility conductor or cable is depicted in figure 7 as item 200.

Furthermore, according to column 3, beginning at line 20, of the '099 patent, the sensors which are monitored by the receivers are used to monitor machine, geological or environmental parameters in the natural resource medium. Thus, according to the '099 patent, that system only provides one-way communication and not bi-directional communication. Further support that the '099 patent does not describe bi-directional communication is that the sensors and transmitters are controlled by a sleep-timer interface which only spontaneously and periodically activates the transmitters and initiates the transmission of multiple short duration bursts, see col. 4, line 64 to col. 5, line 22.

Specifically, the Examiner rejected claims 1 and 3-17 under 35 USC §102(b) as anticipated by U.S. Patent 5,087,099 to Stolarczyk. In support of this ground of rejection, the Examiner asserted:

> Stolarczyk teaches a face control system wherein the communication system comprises a first face sided radio transmission device (192, see col. 7, lines 18-26 and col. 8, lines 24-32) and a second face master control sided radio transmission device (230), the radio transmission devices each having receiver and transmitter modules to carry out wireless and cable free bi-directional data transmission in the end region of the face as called for in claim 1.

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1. Claim 1

Claim 1 expressly recites in part, that the communication system comprises radio transmission devices each having receiver and transmitter modules for carrying out "wireless and cable-free bi-directional data transmission in the end region of the face."

The '099 patent to Stolarczyk fails to disclose "wireless and cable-free" data transmission. Instead, the system of Stolarczyk transmits data by inductive coupling along a utility conductor such as a cable. This is shown in Figure 7 as conductor 200. Claim 1 specifically recites that the data transmission is "wireless and cable-free."

Furthermore, the '099 patent fails to disclose that the data transmission is "bi-directional" as expressly recited in claim 1. As previously noted, the various sensors and transmitters disclosed in the '099 patent are controlled by a sleep-timer interface which only spontaneously and periodically activates the transmitters and initiates the transmission of multiple short duration bursts. This is evidence that the data transmission in the system of the '099 patent is <u>not</u> "bi-directional" as recited in claim 1.

For at least these reasons, it is respectfully urged that the '099 patent fails to disclose all aspects of claim 1, and thus, claim 1 is not anticipated under §102.

2. Claim 3

The Examiner continued and asserted:

> With regards to claim 3; "the communication device in the face" is interpreted as "the first face sided radio transmission device"; which is shown by Stolarcyzk; and disclosed as being on multiple shields; thus is deemed to be spaced as called for in claim 3.

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Claim 3 depends from claim 1, and so, contains all of the recitations of claim 1. Since claim 1 is not anticipated by the '099 patent, then neither is claim 3.

Additionally, it is respectfully urged that upon closer review, it will be appreciated that the '099 patent fails to disclose a configuration in which transmission and receiver modules, spaced a plurality of support shields from each other, carry out "wireless and cable-free bi-directional data transmission" in the end region of the face.

For at least these reasons, it is respectfully submitted that claim 3 is not anticipated by the '099 patent.

3. Claim 4

Regarding claim 4, the Examiner contended:

> Stolarczyk teaches the mining machine having a radio transmission system (e.g. figure 4) as called for in claim 4.

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Claim 4 depends from claim 1, and so, contains all of the recitations of claim 1. Since claim 1 is not anticipated by the '099 patent, then neither is claim 4.

4. Claim 5

Concerning claim 5, the Examiner asserted:

> Stolarczyk teaches the control device as called for in claim 5.

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Claim 5 depends from claim 1, and so, contains all of the recitations of claim 1. Since claim 1 is not anticipated by the '099 patent, then neither is claim 5.

5. Claim 6

With regard to independent claim 6, the Examiner asserted:

> Stolarczyk teaches a face support control system comprising a communication system providing radio communication as called for in claim 6.

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Claim 6 has been clarified to recite that at least one of the communication devices is in "bi-directional" communication with at least one of the plurality of control devices. As previously explained, the system of the '099 patent does not utilize bi-directional communication.

Furthermore, claim 6 additionally recites that the face support control system comprises a communication system that is "wireless and cable-free." As previously explained, these aspects are not disclosed by the '099 patent. Accordingly, it is respectfully submitted that claim 6 is not anticipated by the '099 patent.

6. Claim 7

Concerning claim 7, the Examiner contended:

> Stolarczyk teaches a first radio (e.g. 192) as called for in claim 7.

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Claim 7 depends from claim 6, and so, contains all of the recitations of claim 6. Since claim 6 is not anticipated by the '099 patent, then neither is claim 7.

Moreover, claim 7 expressly recites that the communication device having a first radio unit with transmission and receiver modules, is in radio communication, i.e. "wireless and cable-free," with the face master control. Again, as previously explained, the '099 patent fails to disclose wireless and cable-free bi-directional communication between the face and a face master control located outside the face.

For at least these reasons, it is respectfully submitted that claim 7 is not anticipated by the '099 patent.

7. Claim 8

As for claim 8, the Examiner asserted:

> Stolarczyk teaches a second radio (230) as called for in claim 8.

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Claim 8 ultimately depends from claim 6, and so, contains all of the recitations of claim 6. Since claim 6 is not anticipated by the '099 patent, then neither is claim 8.

Furthermore, claim 8 recites a specific configuration of radio units and communication strategy. Claim 8 recites that the communication system further includes a second radio unit which, together with the first radio unit recited in claim 7, provides radio communication between a communication device and the face master control. The '099 patent entirely fails to disclose these aspects, particularly in combination with the features called for in independent claim 6.

For at least these reasons, it is respectfully submitted that claim 8 is not anticipated by the '099 patent.

8. Claim 9

With regard to claim 9, the Examiner urged:

> Stolarczyk teaches a second communication device (e.g. 192: see col. 7, lines 24-26) as called for in claim 9.

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Claim 9 depends from claim 6, and so, contains all of the recitations of claim 6. Since claim 6 is not anticipated by the '099 patent, then neither is claim 9.

Moreover, claim 9 recites a specific version of the face support control system in which the control system provides radio communication between the face master control and two different communication devices. The '099 patent entirely fails to disclose these aspects, particularly in conjunction with the features called for in independent claim 6.

For at least these reasons, it is respectfully urged that claim 9 is not anticipated by the '099 patent.

9. Claim 10

Concerning claim 10, the Examiner stated:

> Stolarczyk teaches the radio transmission station as called for in claim 11.

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Claim 10 ultimately depends from claim 6, and so, contains all of the recitations of claim 6. Since claim 6 is not anticipated by the '099 patent, then neither is claim 10.

Additionally, claim 10 merely specifies that the communication configuration recited in claim 9 is provided by radio communication. This aspect, in conjunction with the features of claims 9 and 6, are not disclosed by the '099 patent.

10. Claim 11

Concerning claim 11, the Examiner contended:

> Stolarczyk teaches the radio transmission station as called for in claim 11.

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Claim 11 depends from claim 6, and so, contains all of the recitations of claim 6. Since claim 6 is not anticipated by the '099 patent, then neither is claim 11.

11. Claim 12

As for claim 12, the Examiner asserted:

> Stolarczyk teaches a second communication device as called for in claim 12.

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Claim 12 depends from claim 6, and so, contains all of the recitations of claim 6. Since claim 6 is not anticipated by the '099 patent, then neither is claim 12.

Moreover, claim 12 further recites that a second communication device is in communication with another control device, and that the radio station recited in claim 11 provides radio communication between the mining machine and both communication devices. This aspect, particularly in combination with the features in independent claim 6, is simply not disclosed by the '099 patent.

For at least these reasons, it is respectfully submitted that claim 12 is not anticipated by the '099 patent.

12. Claim 13

Concerning independent claim 13, the Examiner asserted:

> Stolarczyk teaches the mining system comprising a mining machine (e.g. 124-130, figure 4); a plurality of support shields (96); a plurality of control devices (258, see col. 8, lines 23-51) for controlling the shields; at least one communication device (192) in communication with at least one of the plurality of control devices; a face master control (e.g. 220, 224); and a radio based communication system (e.g. 236 and 248) providing radio communication between the communication device and the face master control as called for in claim 13.

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Claim 13 has been clarified to specifically recite that the communication system providing communication between a communication device and the face master control is "wireless" and "cable-free." As previously explained, the '099 patent fails to disclose these aspects. Additionally, claim 13 has been amended to recite that the communication device is in "bi-directional" communication with the face master control. These aspects are simply not disclosed in the '099 patent.

13. Claim 14

With regard to claim 14, the Examiner urged:

> Stolarczyk teaches the radio transmission station (192—col. 7, line 24 or 125—col. 6, lines 32-44) providing communication between the mining machine and the communication device as called for in claim 14.

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Claim 14 depends from claim 13 and so contains all of the recitations of claim 13. Since claim 13 is not anticipated by the '099 patent, then neither is claim 14.

14. Claim 15

Concerning claim 15, the Examiner argued:

> Stolarczyk teaches first and second communication devices as called for in claim 15.

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Claim 15 depends from claim 13 and so contains all of the recitations of claim 13. Since claim 13 is not anticipated by the '099 patent, then neither is claim 15.

15. Claim 16

As for claim 16, the Examiner asserted:

> Stolarczyk teaches the radio communication between the first and second devices as called for in claim 16.

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Claim 16 depends from claim 13 and so contains all of the recitations of claim 13. Since claim 13 is not anticipated by the '099 patent, then neither is claim 16.

16. Claim 17

Concerning claim 17, the Examiner contended:

> Stolarczyk teaches the radio transmission station providing communication between the mining machine and at least one of the first and second communication devices as called for in claim 17.

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Claim 17 depends from claim 13 and so contains all of the recitations of claim 13. Since claim 13 is not anticipated by the '099 patent, then neither is claim 17.

In view of the noted clarifications and remarks, it is respectfully submitted that the §102 rejection be withdrawn. It is believed that all claims, i.e. claims 1 and 3-17, are patentable over the '099 patent to Stolarczyk.

E. Rejections under §103(a) Have Been Remedied and Should Be Withdrawn

Claim 2 was rejected under §103(a) as being obvious based upon the '099 patent to Stolarczyk. Specifically, the Examiner contended:

> Stolarczyk fails to explicitly disclose the transmission device on the face edge. Absent any showing of unexpected results, the precise placement of the device is deemed to be obvious to one of ordinary skill in the art.

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Claim 2 depends from independent claim 1. Claim 2 recites many more aspects than just the arrangement of the first face sided radio transmission device, or two face sided radio transmission devices. Claim 2, via its dependency on claim 1, recites in part, that the face support control system performs "wireless and cable-free bi-directional" data transmission in the end region of the face. As previously noted, the '099 patent fails to teach or even suggest that the communication between control devices in the face and the master control outside the face is "wireless," "cable-free," and "bi-directional." The '099 patent entirely fails to teach or even suggest these aspects.

For at least these reasons, it is respectfully submitted that this ground of rejection be withdrawn.

F. Rejection of Claim 18 under §103 Should Be Withdrawn

Claim 18 was rejected for obviousness based upon the '099 patent in view of U.S. Patent No. 5,029,943 to Merriman.

Before addressing the deficiencies of this rejection, it is instructive to note several distinguishing differences between the '943 patent and the subject matter of

claim 18. The system of the '943 patent conveys data of a shearer in one direction, i.e. from the shearer. This one-way transmission of data is to only perform monitoring of the shearer. In contrast, the system as recited in claim 18, ultimately dependent from amended independent claim 13, utilizes "bi-directional" communication.

Specifically, the Examiner based the rejection of claim 18 as follows:

> Stolarczyk fails to teach the transmission station (i.e. the mining machine radio) provides communication between both the first and second communication devices (e.g. two distinct shield radios) and the mining machine.
>
> Merriman teaches a radio (col. 2, line 30) transmission station for communicating between each shield radio and the mining machine. This provides the advantage of allowing the location of the mining machine to be determined (col. 2, line 14).
>
> It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the Stolarczyk system to have the transmission station provide communication between the first and second communication devices and the mining machine as called for in claim 18; in order to facilitate locating the mining machine along the face.

Pages 5-6 of the Office Action.

Claim 18 is ultimately dependent from claim 13, and so, recites a mining system comprising, in part, a radio-based wireless and cable-free bi-directional communication system that provides radio communication between a communication device and the face master control.

Neither of the '099 patent nor the '943 patent, taken singularly or in combination, teach or suggest these aspects. As previously noted, both the '099 and '943 patents fail to disclose bi-directional data transmission to a face controller.

For at least these reasons, it is respectfully requested that the rejection of claim 18 be withdrawn.

G. Conclusion

For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-18) are now in condition for allowance.

Respectfully submitted,

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May 16, 2005
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